

Oil and Gas Industry Perspective on the Arbuckle

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- BS Petroleum Engineering KU, MS Pet Eng Univ. of TX
- Berexco is a private oil and gas company based in Wichita KS.
- Berexco operates hundreds of Arbuckle disposal wells in KS, OK and NE.
- Serve on Arbuckle Working Group Committee
- Berexco involved in Arbuckle reservoir research with KGS for over 10 years.

Topics

- Arbuckle Capacity Issues.
- Types of Disposal Wells (Class 1 and Class 2).
- High rate disposal examples, in particular near Hutchinson KS.
- Importance of KGS for public access to Arbuckle Information.

Arbuckle Capacity

- No concern for oil and gas Class 2 wells.
- Oil industry not suffering reduced capacity because we dispose of salt water, not fresh.
- Some Class 1 wells have capacity issue because disposing fresh water.
- ALL fresh water disposed into Arbuckle is lost forever since Arbuckle is a deep saline reservoir.

Types of Disposal Wells

- Class 1 regulated by KDHE – typically industrial disposal wells, including hazardous waste.
- Class 2 regulated by KCC – brine disposal from oil and gas operations.
- KCC data is public and available on KGS website.
- KDHE data is not made public on KGS website.

Class 2 Disposal Wells

- 16,500 Class 2 injection and disposal wells in KS into various formations. 5,000 are disposal.
- Class 2 Arbuckle disposal well information is publicly available on KGS website.
- Class 2 Arbuckle disposal well completions restricted from disposing into base of Arbuckle in some areas of KS and OK.
- Class 2 Arbuckle disposal volumes decreasing in south central KS.

Pressure VS Static Fluid Level

- KDHE pressure data show bottom hole pressures in Class 1 wells near Hutch are not materially increasing since 2015 - 0.5% or less.
- However static fluid level is increasing on some wells.
- Why? As KGS points out, these wells dispose large volumes of fresh water.
- Berexco's experience at Wellington.

Class 1 Examples from Hutchinson

- Ten Class 1 wells within 10 miles of Earthquake Epicenters near Hutch.
- Class 1 wells permitted for up to 65,000 bbl/day – greatly in excess of KCC max in seismically active areas of 8,000 bwpd.
- Experience in OK and KS shows restricting disposal volumes in wells close to epicenter decreases earthquakes.

Disposal Magnitude and Location

- Three Class 1 wells near Hutch in 2018 disposed of 732 million gallons of fresh water. (Average rate 2 million gallons per day)
- This water is permanently lost.
- In May and July 2019 one nearby Class 1 disposal well had very large disposal rate increases.
- Injection profile logs would clarify where water is going in this well.

KGS Role in Arbuckle Disposal

- KGS has important role in providing information to the public via the KGS website.
- Class 1 disposal volumes and well completion data should be made public.
- Class 2 operators not concerned about Arbuckle capacity. Class 1 is concerned.
- Policy needs to be informed based on full information.